Mass Storage Test Lab at GSFC

Objectives:

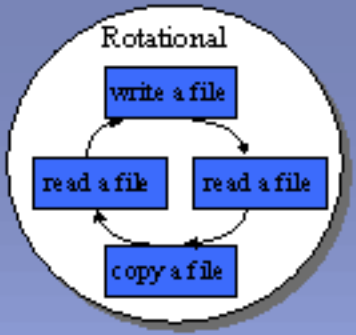
- Promote the development of standardized mass storage benchmarks that will lead to consistent evaluation criteria for mass storage systems.
- Provide the ability to determine the reliability, performance, scalability and maintainability of mass storage system.
- Provide a common basis for evaluation of mass storage systems not only for EOS, but for many other programs at NASA and other agencies.

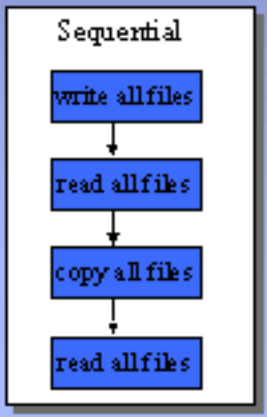
Benchmark Tests

- The current benchmark software suite consists of basic tests including:
  - baseline device read/write tests
  - file storage management system write and read tests
  - forced migration tests
- Software is written in standardized C with Unix scripts for portability across platforms
- Test variables include (among others):
  - blocksize, file size
  - number of files to be written
  - test modes
- Test output is collected in files and plotted in MS Excel for trend analysis

Two test modes:

- Rotational test is performed by
  - writing a file to target location, then reading it, then copying it, then re-reading it.
- Sequential test is performed by
  - writing all of the files to target location, then reading them all, copying all, then re-reading all.
- The two modes allow us to evaluate different performance aspects of the mass storage system and fsms





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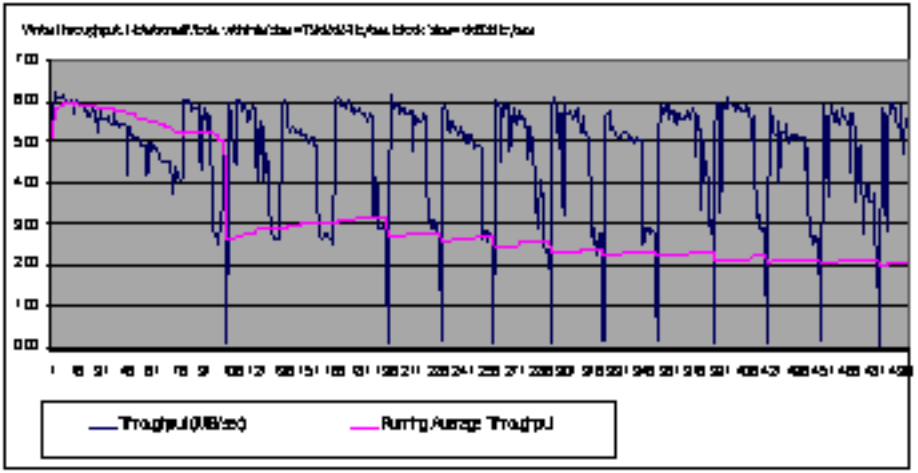
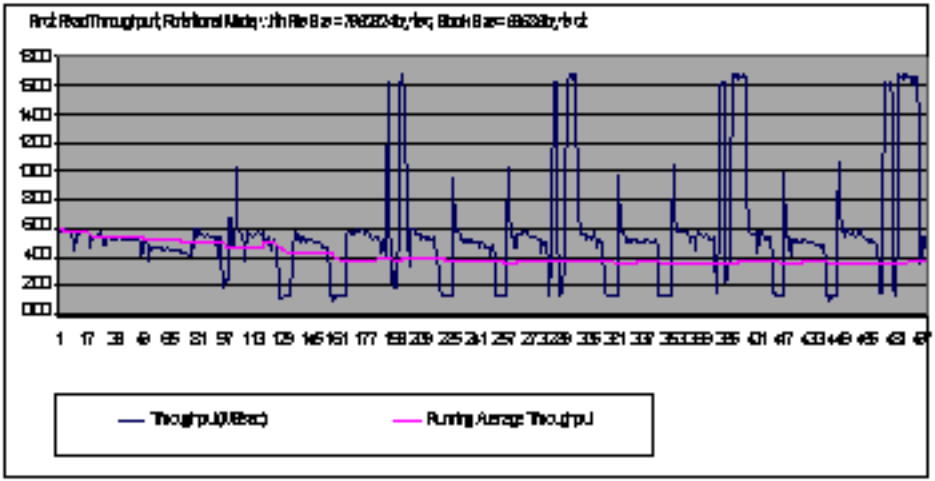
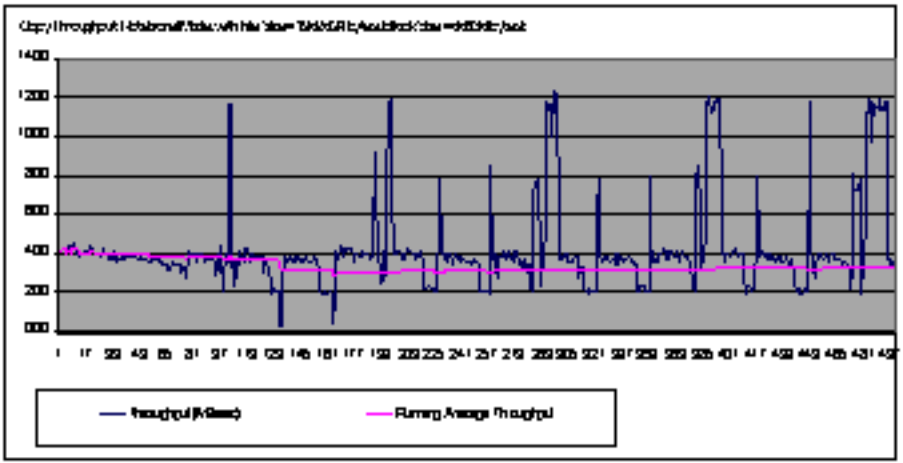
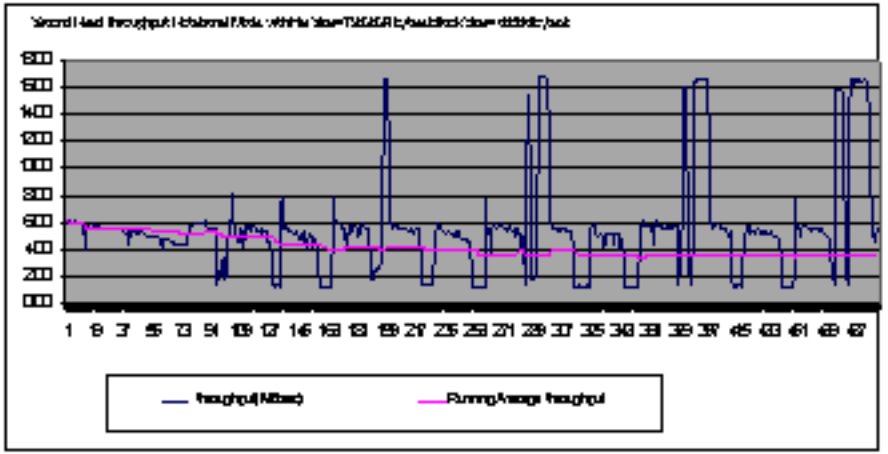
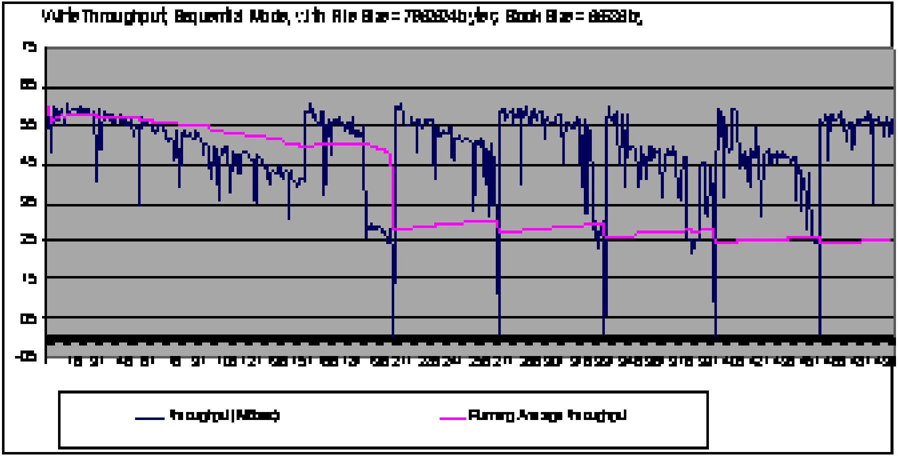

Throughput (MB/sec)
Running Average Throughput

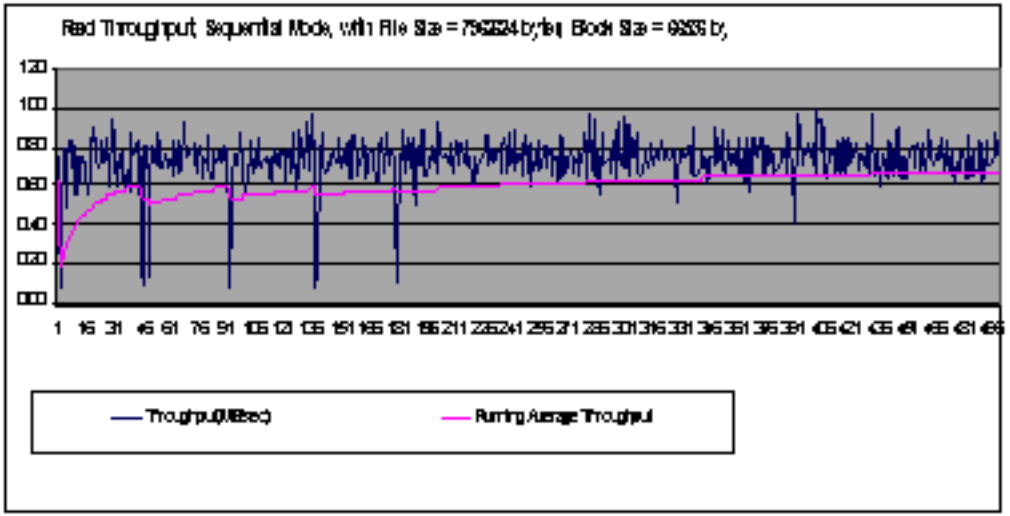

Throughput(KBytes)
Running Average Throughput

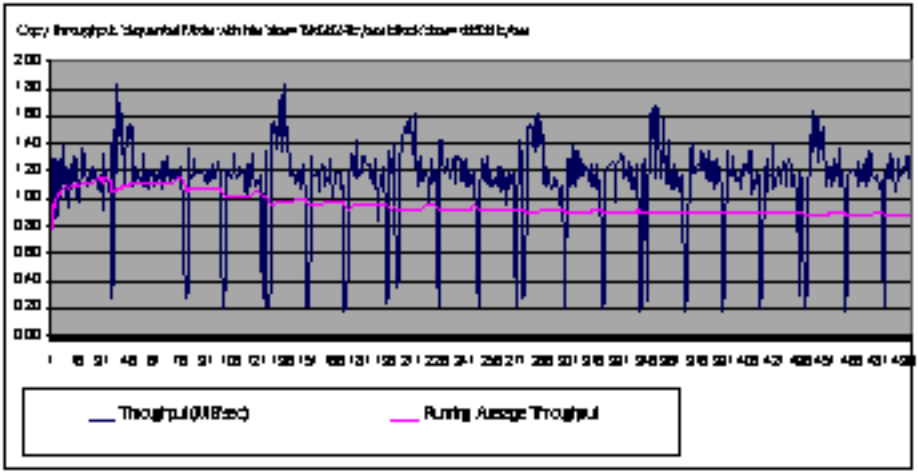

1400
1200
1000
800
600
400
200
000
Throughput (Mbps)
Running Average Throughput

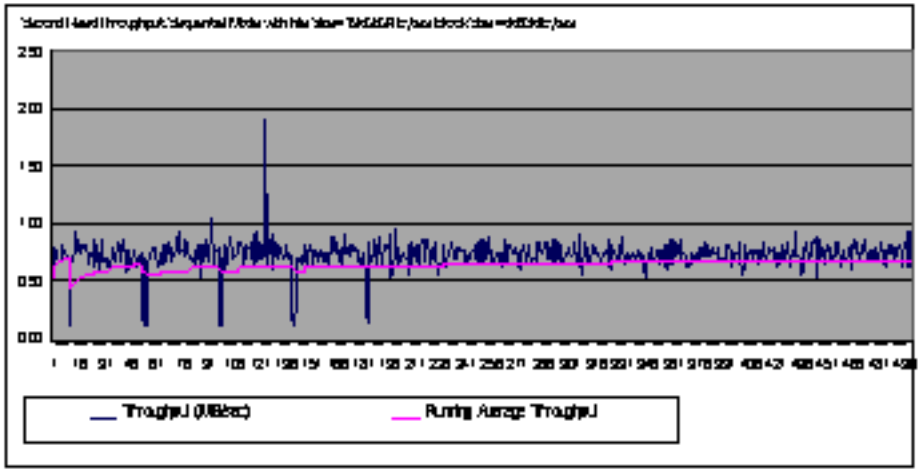

1800
1600
1400
1200
1000
800
600
400
200
000
1 9 17 25 33 41 49 57 65 73 81 89 97 105 113 121 129 137 145 153 161 169 177 185 193 201 209 217 225 233 241 249 257
Throughput (Mbps)
Running Average Throughput



Write Throughput, Sequential Mode
Running Average Throughput


Read Throughput, Sequential Mode, with File Size = 7562624 bytes, Block Size = 65536 bytes
120
100
080
060
040
020
000
1 16 31 46 61 76 91 106 121 136 151 166 181 196 211 226 241 256 271 286 301 316 331 346 361 376 391 406 421 436 451 466 481 496
Throughput(MBps)
Running Average Throughput


Throughput (MB/sec)
Running Average Throughput


250
200
150
100
050
000
Throughput (MB/sec)
Running Average Throughput